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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,832	11/21/2003	Y. Long He	10559-583002	1330

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EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,832

Applicant(s)

HE ET AL.

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24, 25 and 27-43 is/are pending in the application.
- 4a) Of the above claim(s) 32-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24, 25, 27-31, 42 and 43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 27-31, 42, and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Jucha et al, US Patent 4,874,723.

Jucha et al teaches a plasma etching apparatus that includes: a chamber 1306; a support 1320 for supporting a wafer (plate) 48; a first high frequency source attached to an electrode 1314; a second high frequency source attached to a remote plasma generator 1326; an inlet structure 1304, 1322; mass flow controllers connected to each gas inlet to control the amount and concentration of the gases supplied to the chamber and controlled by a control system 206. Jucha et al also teaches forming mixed gas plasma containing SF₆ and CF₄. (Entire document, specifically, figure 32, column 51 lines 36-41; and column 64 line 48-51)

3. Claims 24 and 25 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jucha et al, US Patent 4,874,723.

Jucha et al teaches a plasma etching apparatus that includes: a chamber 1306; a support 1320 for supporting a wafer (plate) 48; a first high frequency source attached to an electrode 1314; a second high frequency source attached to a remote plasma generator 1326; an inlet structure 1304, 1322; mass flow controllers connected to each gas inlet to control the amount and concentration of the gases supplied to the chamber and controlled by a control system 206. Jucha et al also teaches forming mixed gas plasma containing SF₆ and CF₄. (Entire document, specifically, figure 32, column 51 lines 36-41; and column 64 line 48-51)

The specific type of substrate (i.e. quartz) worked on is an intended use of the apparatus. This rejection is based on the fact that the apparatus structure of Hongoh has the inherent capability of working on (i.e. processing) a quartz substrate, as intended by the Applicant. It has also been held that "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963).

Alternately, if the specific type of substrate treated is held not to be an inherent intended use of the apparatus of Jucha et al, then it would have been obvious to one of ordinary skill in the art at the time of the invention was made to etch a quartz substrate using SF₆ and CF₄.

4. Claims 24, 25, 27-31, 42, and 43 are rejected under 35 U.S.C. 102(a) as being

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clearly anticipated by Applicants disclosed prior art.

After describing the apparatus found in Figure 1 the applicant further discloses that "A suitable plasma chamber apparatus is available as model VRL-ME-II-M-QTZ from Unaxis, St. Petersburg, Florida." (See the specification page 4 lines 13-15) The specific process performed on the specific type of substrate is an intended use of the apparatus. The apparatus disclosed by the Applicant can perform the desired process on the desired substrate as indicated by the Applicant.

5. Claims 24, 25, 27-31, 42 and 43 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hongoh, US Patent 6,343,565 B1.

Hongoh teaches a plasma processing apparatus that includes: a chamber S; a support 24 for supporting a wafer (plate) W; a high frequency source 76; and an inlet structure comprising a first gas supply 54 connected to a first inlet 38 via a first flow controller 46, and a second gas supply 56 connected to a second inlet 40 via a second flow controller 48. (Figure 5)

The particular type of gas used to form a specific plasma is a process limitation rather than an apparatus limitation, and the recitation of a particular type of plasma does not so limit an apparatus claim, see *In re Casey*, 152 USPQ 235; *In re Rishoi*, 94 USPQ 71; *In re Young*, 25 USPQ 69; *In re Dulberg*, 129 USPQ 348; *Ex parte Thibault*, 164 USPQ 666; and *Ex parte Masham*, 2 USPQ2d 1647. This rejection is based on the fact that the apparatus of Hongoh has the inherent capability of supplying the desired gases to form the desired plasma intended by the Applicant. Furthermore, It has been held

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that: claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus " if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

The specific type of substrate (i.e. quartz) worked on (i.e. etched) is an intended use of the apparatus. This rejection is based on the fact that the apparatus structure of Hongoh has the inherent capability of working on (i.e. processing) a quartz substrate, as intended by the Applicant. It has also been held that "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

The only structural limitations claimed is a chamber in which a plasma containing multiple gases is formed and a flow controller to control the flow of the plasma gases. Hongoh teaches such a chamber.

Claims 29-31 deal directly with how the apparatus is used. The limitations are

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specifically connected to the type of gases supplied and the specific mixture of these gases. The Examiner can find no structure taught by the applicant that directs or controls the gases to achieve these process limitations (i.e. showerhead, baffle) other than the generic gas inlet system. In fact, the only way to achieve these process limitations taught by the Applicant is to use known mass flow controllers to control the mixture or ratio of the gases delivered to a known apparatus.

Alternately, if the type of plasma formed in the chamber and type of substrate treated are held not to be inherent in the functions of the apparatus of Hongoh, it would have been obvious to one of ordinary skill in the art at the time the invention was made to supply the desired gases in the desired amounts to the apparatus of Hongoh to form the desired plasma and to use the desired plasma to treat the desired substrate.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jucha et al, 4,874,723 in view of Oda et al, Journal of Vacuum Science & Technology (Nov.-Dec. 1996) vol. 14, no. 6, p. 4366-70 "X-ray mask fabrication technology for 0.1 μ m very large scale integrated circuits".

Jucha et al was discussed above.

Jucha et al differs from the present invention in that Jucha et al does not teach

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etching a quartz substrate with SF_6 and CF_4 .

Oda et al teaches etching a quartz substrate with SF_6 and CF_4 . (See section III. B. on pages 4367-67)

The motivation for etching a quartz substrate with a mixture SF_6 and CF_4 in the apparatus of Jucha et al is to provide an etching apparatus in which to carry out the etching process taught by Oda et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the etching method of Oda et al in the apparatus of Jucha et al.

8. Claims 24, 25, 27-31, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongoh, 6,343,565 B1 in view of Oda et al, Journal of Vacuum Science & Technology (Nov.-Dec. 1996) vol. 14, no. 6, p. 4366-70 "X-ray mask fabrication technology for $0.1\mu\text{m}$ very large scale integrated circuits".

Hongoh was discussed above.

Hongoh differs from the present invention in that Hongoh does not teach etching a quartz substrate with SF_6 and CF_4 .

Oda et al teaches etching a quartz substrate with SF_6 and CF_4 . (See section III. B. on pages 4367-67)

The motivation for etching a quartz substrate with a mixture SF_6 and CF_4 in the apparatus of Hongoh is to provide an etching apparatus in which to carry out the etching process taught by Oda et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time

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the invention was made to perform the etching method of Oda et al in the apparatus of Hongoh.

Response to Arguments

9. Applicant's arguments with respect to claims 24 and 27 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments filed June 20, 2005 have been fully considered but they are not persuasive. All the arguments are based on the Applicant's assertion that the claimed plasma and quartz plate are structural elements, and not contents of an apparatus during the operation of the apparatus or materials worked on by the apparatus, the Examiner disagrees.

The formation of a plasma is the very purpose of a plasma apparatus. The apparatus performs work on the gas through the application of energy and forms the plasma. The plasma will only exist while the apparatus is in operation. Therefore, the limitation in claims 24 and 27 requiring a chamber having a specific type of plasma is an expression relating the apparatus to contents thereof during an intended operation and as directed by the MPEP 2115 should be of no significance in determining patentability of the apparatus claim, as held in *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969).

Likewise, the quartz plate is supported in the chamber and etched by the plasma formed by the apparatus in the chamber. Therefore, the quartz plate is being worked on by the apparatus, and as held in *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963))

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inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.

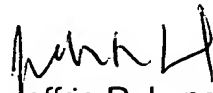
Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeffrie R. Lund
Primary Examiner
Art Unit 1763